Revised Proposed Study Plan
Old Harbor Hydroelectric Project
FERC Project P-13272

May 5, 2010

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1.0 Introduction

The Alaska Village Electric Cooperative (AVEC), the electrical utility provider in Old Harbor, Alaska, is filing with the Federal Energy Regulatory Commission (FERC) its Proposed Study Plan (PSP) as part of the Integrated Licensing Process (ILP) for the Old Harbor Hydroelectric Project (FERC No. P-13272).

The proposed Old Harbor Hydroelectric Project consists of:

- An estimated dependable capacity of 130 kW and peak capacity of 400 kW.
- A water intake area including a 4 foot cutoff (diversion) wall that will not create any significant impoundment of water.
- A 10,400 feet (approximate) penstock.
- A single 400-kW Pelton turbine with a hydraulic capacity of 8 cfs coupled directly to a 480-volt, 3-phase generator.
- A 1200 square feet (approximate) power house at the turbine's tailrace.
- Water discharge into a lake or channeled across the lowlands to a nearby stream with final discharge at Big Creek.
- A 1.4 mile, 7.2 kV three-phase overhead power line installed.
- A 1.4 mile (approximate) access road.

The Old Harbor Hydroelectric Project is proposed within the Kodiak National Wildlife Refuge (NWR or Refuge), and as such must be consistent with the *Kodiak NWR Comprehensive Plan* (USFWS 2008) and must obtain a Right-of-Way and Compatibility Determination from the U.S. Fish and Wildlife Service (USFWS) in order to construct.

Pursuant to the FERC ILP (18 Code of Federal Regulations [CFR] Part 5), AVEC filed its Pre-Application Document (PAD) with the FERC on August 24, 2009. The PAD describes the proposed project; characterizes the affected environment and potential resource impacts of construction; and sets forth a Process Plan and Schedule for all pre-application activities and stakeholder participation. In addition, the PAD lists resource studies proposed by AVEC for detailed development in this PSP. The PAD is available on the FERC eLibrary: http://www.ferc.gov/docs-filing/eLibrary.asp

The FERC issued Scoping Document 1 (SD1) on September 21, 2009, and held a National Environmental Policy Act (NEPA) scoping meeting in Anchorage on October 22, 2009. FERC attempted to hold a scoping meeting in Old Harbor on October 21, 2009; however, poor weather kept FERC representatives from reaching the community, and the meeting was cancelled. Stakeholders subsequently filed their comments on the PAD and SD1, as well as study requests, by November 20, 2009. The Commission requires that any study requests address the content criteria set forth at 18 CFR § 5.9(b).

This PSP was filed with FERC for review and comment by stakeholders, who had until April 5, 2010 to file their comments. During the 90-day comment period, AVEC consulted with the

resource agencies and other participants during two Study Plan Meetings. The goal of these meeting was to discuss information gathering needs and informally resolve differences between the PSP and the study requests filed by stakeholders. This Revised Proposed Study Plan follows the PSP comment period.

1.1 Content and Organization of Proposed Study Plan

With respect to each proposed study, this PSP provides the following information as required at 18 CFR § 5.11(b):

- A detailed description of the study and the methodology to be used.
- A schedule for conducting the study.
- A schedule for submitting a progress reports, to be filed by AVEC by September 1, 2010, including the manner and extent to which information will be shared and sufficient time for technical review of the analysis and results.
- If a requested study was not adopted, an explanation of why, with reference to the study request criteria set forth at 18 CFR § 5.9(b).
- Additionally, as required by 18 CFR § 5.11(c) and reference therein to § 5.15, AVEC has made provisions for the Study Reports and Study Results Meetings.

The Study Plans for each of resource areas are provided in Sections 2 through 4. Each Study Plan follows the content requirements at 18 CFR § 5.11(d) by:

- Describing the goals and objectives of the study proposal and the information to be obtained.
- Addressing any known resource management goals of the Kodiak NWR and agencies with jurisdiction over the resource to be studied.
- Describing existing information concerning the subject of the study proposal and the need for additional information.
- Explaining any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied.
- Explaining how the proposed study methodology is consistent with generally accepted practice in the scientific community.
- Describing considerations of level of effort and cost, as applicable.

1.2 Study Requests Not Adopted

In their October 15, 2009 PAD comments letter, the Alaska Department of Fish and Game (ADF&G) provided comments and requested the following studies:

- Mountain Creek (called Barling Creek Tributary and Hydro Creek in previous studies) aquatic study
- Big Creek wetlands and tributary aquatic study

In their November 20, 2009 PAD comments letter, the USFWS provided comments and requested the following studies:

- Fish and aquatic studies of Mountain Creek

- Fish and aquatic studies of Big Creek
- Fish and aquatic studies of Big Creek side channels and wetlands
- Weather and Climate Data Update Study
- Additional hydrologic discharge data collection
- Bald eagle nest survey

In their March 31, 2010 draft PSP comment letter, NOAA Fisheries provided the following comments and requests for studies and measurements:

- Analysis of lost habitat or loss in flow in the Mountain Creek watershed due to the diversion of up to 7cfs of water from the creek
- Fish rearing surveys of the Mountain Creek watershed during a typical water year
- Temperature and hydraulic monitoring and habitat quality mapping of the Lagoon Creek receiving waters
- Spawning salmon surveys in the Lagoon Creek (also referred to as Stream 2004) receiving waters

In their April 5, 2010 draft PSP comment letter, ADF&G provided the following comments and requested the following studies and measurements:

- Spawning salmon surveys in Stream 2004 (also called Lagoon Creek Tributary) and its headwater lake
- Temperature monitoring in Stream 2004's headwater lake
- Analysis of the existing hydrologic data collected on the Mountain Creek mainstem
- Water discharge measurements at the outlet of stream 2004's headwater lake

All written correspondence from agencies is included in Appendix A.

AVEC considered whether to perform the studies requested by ADF&G and USFWS in accordance with 18 CFR § 5.11.d and 5.9(b). In accordance with 18 CFR § 5.11.b.4, the following section and Appendix B of this PSP explains why the some study requests were not adopted.

It was determined that fish and aquatic studies would not be conducted in Big Creek, its side channels, or Mountain Creek based on the following rationale (See Appendix B for more details):

- This project would not impact Big Creek or its side channels.
- The goals and objectives for a fish and aquatics study have been met by past studies. (Appendix C contains fish and aquatic studies conducted during previous project efforts.)
- Past studies enumerated very little aquatic life in the creeks studies. The agencies' requests have not provided sufficient information to suggest that the small amount of aquatic life existing in creeks are, even on a small regional scale, required to meet management goals.

- Repeating past studies is not likely to provide any new and meaningful information for the license development.

It was determined that weather and climate data update study, as requested by USFWS, would not be conducted based on the following rationale (See Appendix B for more information):

- AVEC has not collected any climatic data (new or existing) and does not consider collection of climatic data necessary.
- Climate studies are not the preferred means of obtaining hydrologic data for hydroelectric projects.

It was determined that additional hydrologic discharge data collection, as requested by USFWS, would not be conducted; however, additional analysis of hydrological data was completed and is included in Appendix D.

1.3 Master Schedule for Study Implementation

The schedule in Table 1 provides the estimated start and completion dates of all proposed field studies, deadlines for filing Progress Reports and Study Reports, and the dates for Study Results Meetings. All proposed fieldwork will be completed during one study season (i.e., 2010). Progress Reports for each resource will be filed as a complete package on September 1, 2010, and Study Reports will be filed as a complete package on November 23, 2010.

Table 1.
Master Schedule for Study Implementation for the Old Harbor Hydroelectric Project

Activity	Start Date	Completion Date/Deadline
Conduct Field Studies [1]		
Wetlands Study	June 7, 2010	November 1, 2010
Cultural Resources Study	June 7, 2010	November 1, 2010
Bald Eagle Nest Survey	June 7, 2010	November 1, 2010
Hydrology Study	June 7, 2010	November 1, 2010
Fisheries and Fish Habitat Study	August 23, 2010	November 1, 2010
File Progress Reports (All Studies)		September 1, 2010
File Study Report		November 23, 2010
Hold Study Report Meeting		December 8, 2010
File Study Report Meeting Summary		December 23, 2010
Comments/Study Disputes/Requests to Modify Study Plan (if necessary)		January 22, 2011
File License Application		April 22, 2011

[1] Assumes one season of field studies in 2010

1.4 Study Plan Meetings

In accordance with 18 CFR § 5.11(e), AVEC held an initial Study Plan Meeting on Friday, January 22, 2010 between 10 am and 2 pm at the AVEC office in Anchorage. The purpose of this meeting was to clarify AVEC's PSP and stakeholders' study requests and to work together to informally resolve any outstanding issues with respect to the PSP. Another meeting regarding the PSP was held on Thursday, April 1, 2010 between 3 pm and 5 pm at AVEC's Anchorage office. The meeting further explained the project using new Lidar imagery. Agency representatives commented on the PSP and made suggestions for additional studies. (Meeting notes are found in Appendix A.) AVEC has incorporate many comments received during these meetings in this Revised PSP. ,.

1.5 Relationship of the Resource Studies to the License Application

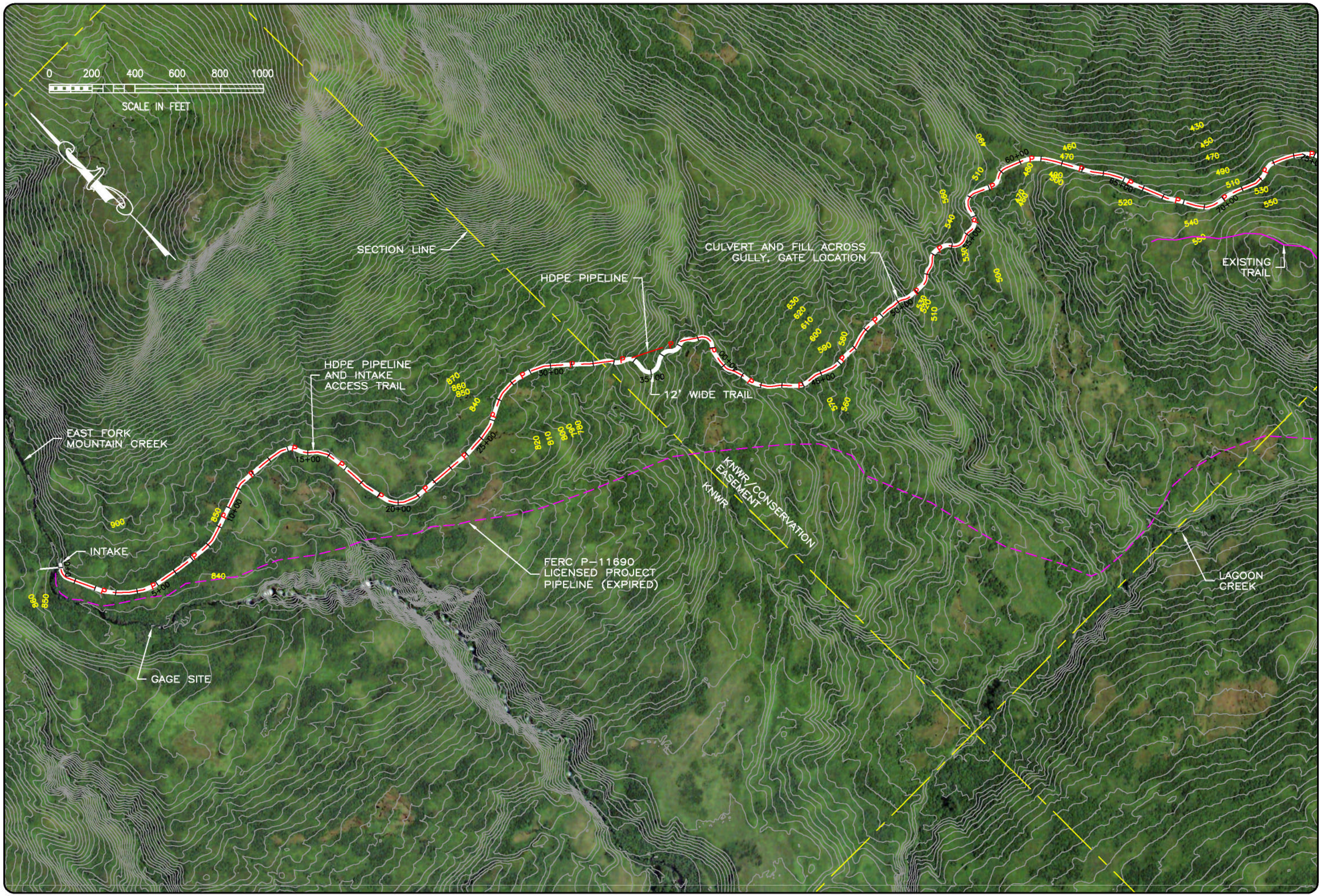
Each resource study will culminate in the preparation of a Study Report (Table 1), which will develop information sufficient for characterizing the existing environment and evaluating the potential impacts of the construction of the Old Harbor Hydroelectric Project's Preliminary Licensing Proposal (PLP) and subsequent license application. The findings of the studies will be incorporated into the PLP, which will be filed by November 23, 2009, and made available for public comment (18 CFR § 5.16). The PLP will provide a draft environmental analysis by resource area of the impacts of the proposed action using the findings of the studies and will propose measures for the purpose of protecting, mitigating impacts to, or enhancing resources affected by the project.

Based on comments on the PLP filed by stakeholders and agencies, AVEC will revise and incorporate the PLP into the license application as Exhibit E (18 CFR § 5.18). The license application will be filed by April 22, 2011. Exhibit E will include evaluation of reasonable and feasible alternatives to the proposed action, address cumulative impacts, and include measures as appropriate for enhancing environmental resources affected by the project proposal.

Under the ILP, FERC's NEPA document, which is also issued for public comment, will include the Commission's determination regarding reasonable and feasible alternatives and cumulative impacts, in addition to all other necessary and appropriate NEPA analysis.

1.6 References

U.S. Fish and Wildlife Service (USFWS). 2008. Revised Comprehensive Conservation Plan Kodiak National Wildlife Refuge. Prepared by the USFWS Region 7.



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REVISIONS

NO.	DATE	

Drawing: PROJECT MAP
INTAKE AND UPPER PIPELINE

Project: OLD HARBOR HYDROELECTRIC PROJECT
ALASKA VILLAGE ELECTRIC COOPERATIVE
FERC PROJECT NO. P-13272

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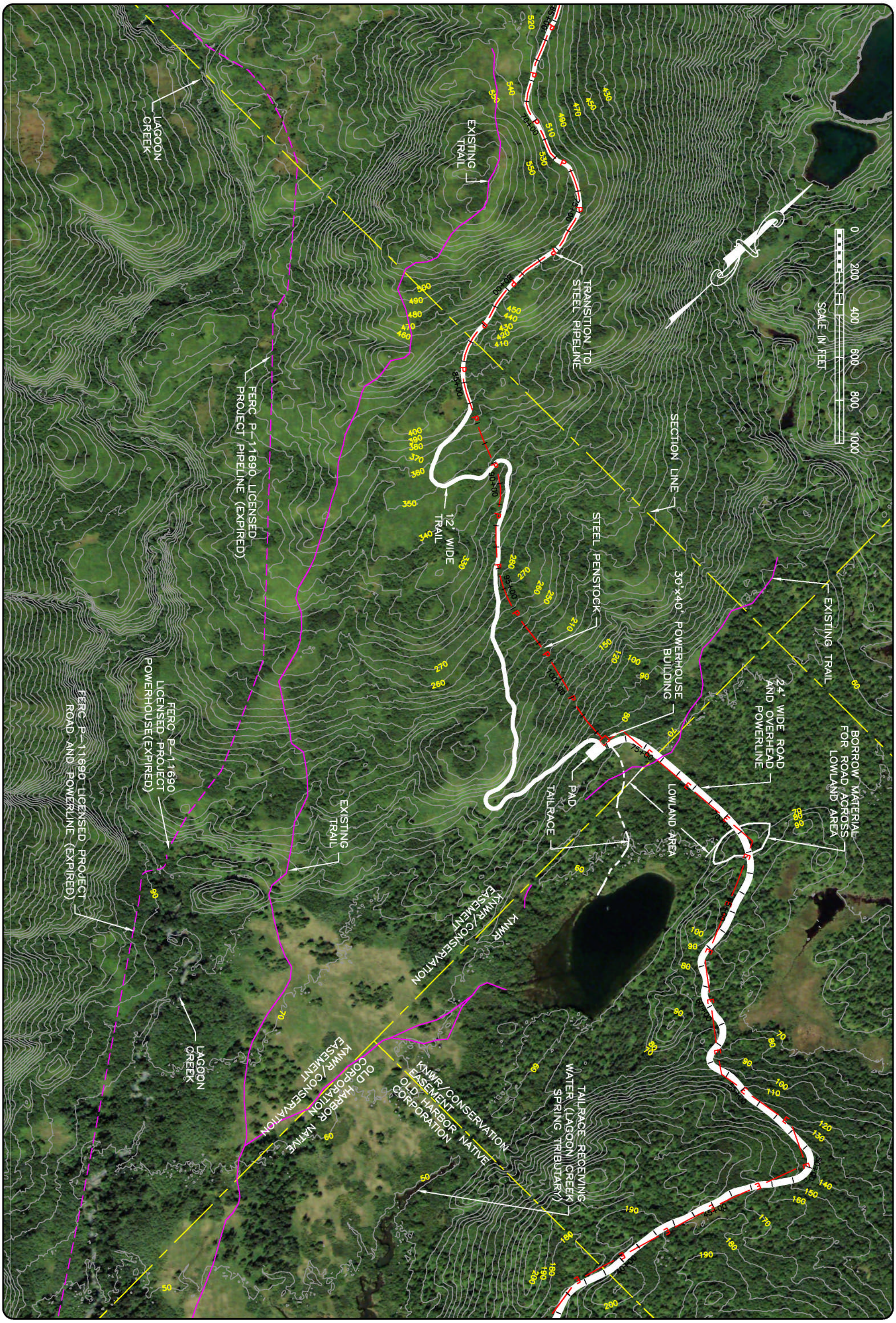
OF 3



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Drawing
PROJECT MAP
LOWER PIPELINE AND POWERHOUSE

Project
OLD HARBOR HYDROELECTRIC PROJECT
ALASKA VILLAGE ELECTRIC COOPERATIVE
FERC PROJECT NO. P-13272

NO.	DATE	REVISIONS

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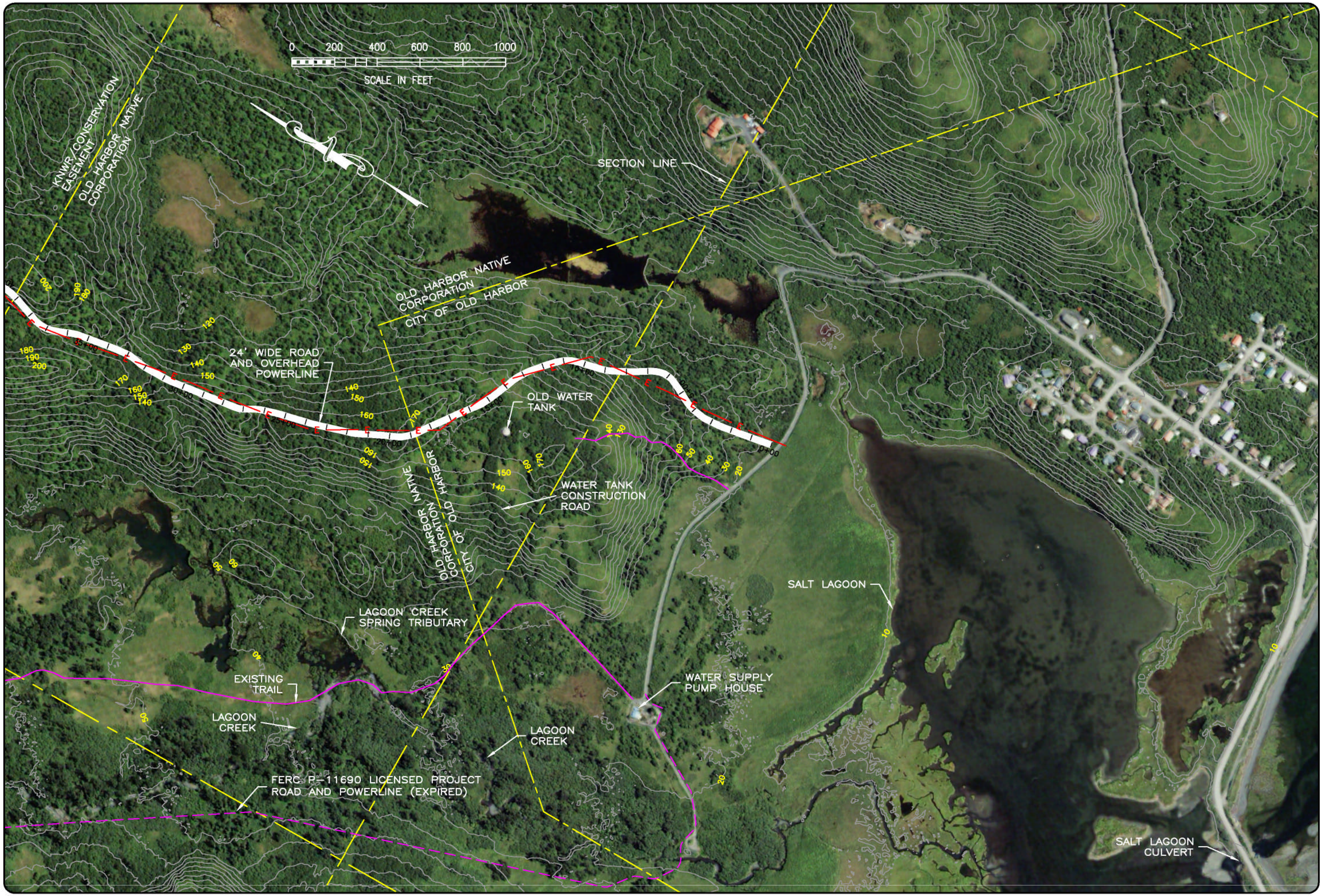

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NO.	DATE	REVISIONS

Drawing: PROJECT MAP POWERLINE AND ROAD

Project: OLD HARBOR HYDROELECTRIC PROJECT ALASKA VILLAGE ELECTRIC COOPERATIVE FERC PROJECT NO. P-13272

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2.0 Fisheries and Fish Habitat Study

2.1 Introduction

AVEC proposes to characterize fish presence and fish habitats in the Old Harbor Hydroelectric Project area through the use of existing information and data and a field reconnaissance survey.

2.2 Goals and Objectives

The goal of the study is to characterize the fish presence, types, and habitat in order to evaluate resource issues identified during the FERC's public scoping process conducted pursuant to NEPA and to assist with permitting activities later in the project development process.

The specific study objectives are to:

- Document the fish types and numbers in the proposed Old Harbor Hydroelectric project tailrace area.
- Detail the aquatic environment in the proposed Old Harbor Hydroelectric project tailrace area.

2.3 Study Background

2.3.1 Issues Identified

The FERC's ILP requires an assessment of potential beneficial and adverse effects of the project on wildlife and botanical resources in the license application. This study will develop information needed to evaluate potential impacts of the construction of a hydroelectric project in Old Harbor on fisheries in the project area.

2.3.2 Study Requests

In its PAD comments letter dated November 20, 2009, the USFWS requested a fish and aquatic resource study of Big Creek and on the side channels and wetlands of Big Creek that will be affected by tailrace discharge.

The Alaska Department of Fish and Game (ADF&G) recommended AVEC conduct a fish and aquatic resource study in the side channels and wetlands of Big Creek that will be affected by the tailrace stream flow in their PAD comments letter dated October 15, 2009. In later emails and meetings with the agency, ADF&G recommended spawning surveys in Lagoon Creek Tributary (Stream #258-52-10015-2004).

2.3.3 Resource Management Goals

The Kodiak NWR Comprehensive Conservation Plan has the following goal, which applies to fisheries:

- Conserve the abundance of natural salmonid populations for continued human and wildlife use, and ensure the diversity of species as indicators of the health of the Refuge's ecosystem (Goal 7).

The ADF&G and its Commissioner is directed by Alaska State Statute Title 16 to manage, protect, maintain, improve, and extend the fish, game, and aquatic plant resources of the state in the interest of the economy and general well-being of the state.

2.3.4 Existing Information

Water Quality. The water quality of the waterbodies associated with this project is assumed to be good, since they are in an undeveloped area. Neither the Mountain Creek nor Lagoon Creek Tributary (Stream 2004) are listed as Section 303(d) impaired waterbodies by the State of Alaska (ADEC 2010 and ADEC 2008).

Fish Presence. According to the State of Alaska Catalog of Anadromous Streams, Lagoon Creek (258-52-10015) and its Lagoon Creek Tributary (258-52-10015-2004) support spawning coho (*Oncorhynchus kisutch*), chum (*O. keta*), and pink (*O. gorbuscha*) salmon (ADF&G 2009). The National Marine Fisheries Service Essential Fish Habitat lists the areas identified above as Essential Habitat for all species of salmon (NMFS 2009).

AVEC performed extensive studies of the fishery resources as part of the previous licensing process. The two areas of study were Mountain Creek and Lagoon Creek. Three reports were provided by AVEC's fishery consultant, Lonnie White (White, 1996, 1996a, 1998), pertaining specifically to assessment of resources and impacts in those two drainages on August 9, and September 3 and 23, 1996; and August 13 and 14 and October 6, 1998. Methods included observations and counts from helicopter and foot, electrofishing, and minnow traps. During all surveys, no fish were observed in the East Fork.

No information is available on the numerous small lakes and feeder streams located between Lagoon Creek Tributary and Big Creek, but the presumption is that those would be catalogued by ADF&G as being anadromous streams. In the report by White (1998), the spring fed feeder streams with consistent flow, like the Lagoon Creek Tributary, attracted spawning salmon whereas the streams that occasionally went dry, like the main branch of Lagoon Creek, were devoid of spawning salmon.

2.3.5 Nexus between Project Operations and Effects

The construction of the Old Harbor Hydroelectric Project may directly affect fisheries in the area, it is determined that fish populations are present in the tailrace area.

2.4 Study Area

The proposed study area includes Lagoon Creek Tributary (Stream 258-52-10015-2004 also referred to as Stream 2004) between the proposed tailrace area at a headwater lake and its mouth at Old Harbor Lagoon.

2.5 Methodology

AVEC's approach for completing the Fisheries Study consists of the following elements.

2.5.1 Littoral and Riverine Habitats Survey

A field reconnaissance survey of the study area will be conducted in summer 2010 to groundtruth preliminary GIS maps and characterize wetland, riparian, and littoral habitats. Physical habitat conditions will be visually assessed and documented at various locations throughout the tailrace area to include such features as depth, velocity, substrate types (percent mud, sand, gravel, cobble, bedrock, or other cover), stream width, in-stream woody cover, bank vegetative condition, and riparian zone condition. All fish and other animals (beavers, muskrats, etc) and their sign will be recorded. In addition, water temperature and dissolved oxygen measurement will be recorded at each site. Field forms will be completed to document the findings.

2.5.2 Temperature Monitoring

Temperature will be monitored in Lagoon Creek Tributary and the headwater pond to determine whether there are temperature differences geographically or temporally. Temperature recording instruments and data loggers will be installed at the tailrace pond, at the pond outlet, and at the intake site to record data every two hours between early June and the end of September. Locations of the instruments will be determined in the field and will be mapped from coordinates determined using the Global Positioning System (GPS). Each instrument and data logger will be inconspicuously tethered to the shore for retrieval and downloading. Each data logger will have a waterproof tag attached to it that identifies it as a scientific instrument and gives contact information in case it is lost or disturbed. Data loggers will be programmed to record stream temperature every two hours and will be downloaded at the end of the summer season.

2.5.3 Fish Survey

A spawning survey will be conducted in Lagoon Creek Tributary (Stream 2004) in late August to determine fish presence, particularly spawning pink salmon, chum salmon, and coho salmon.

During the littorial and riverine habitat work (described above), and prior to initiating the fish survey, Lagoon Creek Tributary will be divided into reaches based on the characteristics of the reach (pool, riffle, mouth, wetland complex, etc.). Each reach will be mapped using GPS coordinates. Fish use for each reach will be collected and recorded separately.

The survey will be lead by an experienced fisheries scientist who will conduct the visual survey of the Lagoon Creek Tributary (Stream 2004) between the mouth at the Old Harbor Lagoon and the proposed tailrace area at the Lagoon Creek Tributary Pond. Polarized sunglasses will be used and hand tally counters, if necessary, to document numbers present.

During the foot survey, the following information will be recorded for each stream reach on a field data sheet:

- Date and time of survey
- Stream reach
- Fish species observed
- Approximate numbers

2.6 Reporting

In accordance with 18 CFR § 5.15(b), a Fisheries Study Progress Report will be prepared and provided to participants for technical review of preliminary findings prior to the completion of the study. The progress report will describe overall progress in completing the fisheries field survey, summarize preliminary findings as available, and explain any variance from the Study Plan and schedule.

In accordance with 18 CFR § 5.15(c)(1), a Fisheries Study Report will be prepared and provided to participants for review and comment at the conclusion of the study. The report will include a description of the project area, the investigation and field methods, and the findings and rationale used to reach conclusions. Descriptions of each riverine and littoral habitat within the project area will be completed and will include whether the habitat is indicative of fish habitat. Fish survey forms and ground photos will be included in the report.

2.7 Schedule

The fisheries field effort will be initiated on August 23, 2010. A progress report will be filed on October 1, 2010. The Fisheries Study will be filed on November 23, 2010.

2.8 References

Alaska Department of Environmental Conservation (ADEC). February 24, 2010. Alaska's Draft 2010 Integrated Water Quality Monitoring and Assessment Report.

Alaska Department of Fish and Game (ADF&G). 2009. Alaska Department of Fish and Game, Anadromous Waters Catalog. Accessed at: http://www.sf.adfg.state.ak.us/SARR/AWC/index.cfm/FA/main.overview

National Oceanic and Atmospheric Administration (NOAA) Fisheries. 2009, Essential Fish Habitat Mapping. Access at: http://www.nmfs.noaa.gov/habitat/habitatprotection/efh/

U.S. Fish and Wildlife Service (USFWS). 2008. Revised Comprehensive Conservation Plan Kodiak National Wildlife Refuge. Prepared by the USFWS Region 7.

White, Lorne. 1996. Memorandum: Old Harbor Fisheries Work August 9, 1996. Prepared August 13, 1996.

White, Lorne. 1996a. Memorandum: Old Harbor Fisheries Work September 3, 1996 and September 23, 1996, Brief Report. Prepared October 8, 1996.

White, Lorne. 1998. Memorandum: Old Harbor Fisheries Work. Prepared October 1998.

3.0 Wetlands Study Plan

3.1 Introduction

AVEC proposes to characterize existing wetlands habitats in the Old Harbor Hydroelectric Project area through the use of existing information and data and a field reconnaissance survey.

3.2 Goals and Objectives

The goal of the study is to characterize existing wetlands habitat and any "Waters of the U.S." for evaluating significant resource issues identified during the FERC's public scoping process conducted pursuant to NEPA and to assist with permitting activities later in the project development process.

The specific study objectives are to:

- Describe floodplain and wetland habitats occurring in the project area.
- Prepare a map delineating wetland, riparian, and littoral habitats in the project area.
- Describe the functions of the wetland habitats in the project area.

3.3 Study Background

3.3.1 Issues Identified

The FERC's ILP requires an assessment of potential beneficial and adverse effects of the project on wildlife and botanical resources in the license application. This study will develop information needed to evaluate potential impacts of the construction of a hydroelectric project in Old Harbor on wetlands habitats in the project area.

3.3.2 Study Requests

There were no formal requests for wetlands delineation during the scoping process; however, the U.S. Army Corps of Engineers (USACE) preliminarily determined that the project area contained wetlands and waters of the U.S. under the USACE's jurisdiction in their PAD comments letter dated October 6, 2009. Also, during the previous project effort, the USACE requested "more detailed (wetlands) delineation of the project and its components' location (USACE 1996)." AVEC is proposing this study since the project location has changed, since a wetlands delineation was previously requested, and since a wetlands delineation will likely be needed in order to obtain a Department of Army (Wetlands) Permit.

3.3.3 Resource Management Goals

The Kodiak NWR Comprehensive Conservation Plan has the following goals which apply or relate to wetlands, riverine, and littoral habitats:

- Maintain and restore native plant populations, communities, and habitats (Goal 6).

- Ensure that Kodiak brown bears continue to flourish throughout the Refuge and congregate at traditional concentration areas (Goal 2).

3.3.4 Existing Information

Wetlands in the project area are small, generally isolated, and scattered depressions and valleys that fill with water and peat. At higher elevations, the wetlands are dominated by moss overlying peat to a depth of solid bedrock. In the low lying areas near the proposed powerhouse, the wetlands are more extensive and are mostly grass and peat overlying soil and gravel. Wetlands are associated with a few active springs emerging from the talus slopes above Lagoon Creek. The lowlands that the proposed tailrace water travels through are characterized by extensive lakes, wetlands, and feeder streams.

3.3.5 Nexus between Project Operations and Effects

The construction of the Old Harbor Hydroelectric Project may directly affect wetlands in the area.

3.4 Study Area

The proposed study area includes the project boundary, defined by the 100-foot buffer around all Old Harbor Hydroelectric Project components.

3.5 Methodology

AVEC's approach for completing the Wetland Study consists of the following elements.

3.5.1 Background Research/Office Delineation

Existing wetlands, riparian, and littoral habitats in the project study area will be described and wetland/upland boundaries and any "waters of the U.S." will be determined within the project area based on review of existing information, recent aerial photography, and National Wetlands Inventory (NWI) maps. Preliminary maps will be prepared using geographic information systems (GIS).

3.5.2 Field Reconnaissance Survey

The field survey will assess the presence of hydrophytic plant species, hydric soils, and wetland hydrology at a representational number of sites. The field work will be based on the Corps of Engineers' standard three parameter approach presented in the 1987 Wetlands Delineation Manual, and will employ the methods described in the 2007 Alaska Regional Supplement to the Corps of Engineers Wetland Delineation Manual (USACE 2007). Standard wetland delineation forms will be prepared and ground photos will be taken at each location.

Details regarding the wetland functions, including hydrologic and water quality, ecologic, and socioeconomic, of each wetland type will be gathered in the field. Data on physical and biological features that contribute to functions and values of a wetland will be collected by completing a functional assessment form. Examples of indicators could include topographic

position, location in the watershed, vegetation communities, hydrological input and output, presence of water, and habitat or wildlife observations. The indicators and other field observations will then be used to assess wetland functions and values qualitatively using best professional judgment.

3.6 Reporting

In accordance with 18 CFR § 5.15(b), a Wetlands Study Progress Report will be prepared and provided to participants for technical review of preliminary findings prior to the completion of the study. The progress report will describe overall progress in completing the field survey, summarize preliminary findings as available, and explain any variance from the Study Plan and schedule.

In accordance with 18 CFR § 5.15(c)(1), a Wetlands Study Report will be prepared and provided to participants for review and comment at the conclusion of the study. The report will include a description of the project area, the investigation and field methods, and the findings and rationale used to any conclusions. Description of each riverine and littoral habitat within the project area will be completed and will include whether the habitat is indicative of fish habitat. The character of each wetland complex, including dominant vegetative cover, soil types, and hydrologic regime, will be described and a determination will be made as to whether each would be considered "jurisdictional wetlands." Wildlife and plant species lists will be compiled for the common species found in the project area. Riparian and littoral characterization forms, wetland delineation forms, wetland functional assessment forms, and ground photos will be included in the report. Wetland/upland boundaries on aerial photography and digital format of the boundaries will also be provided.

3.7 Schedule

The Wetlands, Riparian, and Littoral Habitat Study field effort will be initiated on June 7, 2010. A progress report will be filed on September 1, 2010. The Wetlands, Riparian, and Littoral Habitat Study will be filed on November 23, 2010.

3.8 References

U.S. Army Corps of Engineers Environmental Laboratory (USACE). 2007. Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Alaska Region. Vicksburg, MS.

U.S. Army Corps of Engineers (USACE). March 27, 1996. Letter to Ms. Lois Cashell, Secretary, Federal Energy Regulatory Commission, from USACE, Water Management Division in Portland, Oregon, regarding comments on FERC applications provided by the Alaska, Portland, and Walla Walla Districts of the North Pacific Division of the USACE.

U.S. Fish and Wildlife Service (USFWS). 2008. Revised Comprehensive Conservation Plan Kodiak National Wildlife Refuge. Prepared by the USFWS Region 7.

4.0 Cultural Resources Study Plan

4.1 Introduction

AVEC proposes to conduct a survey of the Old Harbor Hydroelectric Project area to identify and evaluate archaeological and historical resources within the area of potential effect (APE). The study will consist of a pedestrian survey of project area and a review of available information on known archaeological and historical sites in the area. The results of this work will be provided in a report that describes the archaeological resources Old Harbor Hydroelectric Project Area.

4.2 Goals and Objectives

The goal of this study is to identify and document historic properties located within the project boundary and immediately adjacent areas that could be affected by the construction of the project.

Specific objectives of this study are to:

- Identify and delineate the APE.
- Identify known historic resources through literature and database file review.
- Identify presently unknown archeological resources through a terrestrial survey within the project boundary.
- Determine if any historic properties are eligible for listing on the National Register of Historic Places (NRHP).
- Evaluate the potential for effects of construction of the project upon historic resources.

4.3 Study Background

4.3.1 Issues Identified

The FERC's ILP requires an assessment of potential beneficial and adverse effects of the project on cultural resources in the license application. This study will develop information needed to evaluate potential impacts of the construction of a hydroelectric project in Old Harbor on cultural resources.

4.3.2 Study Requests

There were no formal requests for a cultural resources study during the scoping process; however, Section 106 of the National Historic Preservation Act (NHPA) requires FERC to consider the effects of its undertakings on historic properties. A field survey is needed to adequately analyze potential project impacts. In addition, it is likely that the State Historic Preservation Officer (SHPO) will request a field survey in order to complete the Section 106 consultation process.

4.3.3 Resource Management Goals

One goal of the Kodiak Refuge Revised Comprehensive Conservation Plan is: Conserve cultural and archaeological resources of the Refuge (Goal 13; USFWS 2008). The plan identifies objectives related to this goal which include performing surveys in priority area to evaluate whether sites are eligible for the National Register of Historic Places (NRHP).

A cultural resource plan for Kodiak Refuge, completed in 1999, provides guidance for cultural resource management on the Refuge. It outlines legal mandates and considerations, reviews current information about resources, and establishes goals and objectives for the program. The cultural resource plan was scheduled for review in 2009.

4.3.4 Existing Information

Old Harbor falls within the traditional territory of the Koniag, one of three regional groups of the Alutiiq people. At historic contact, the Koniag inhabited coastal environments of the Kodiak Archipelago and the Alaska Peninsula. In the Kodiak Archipelago, the cultural history of the Alutiiq is preserved in a multitude of archaeological sites. Dense prehistoric populations left large accumulations of cultural debris that have resisted decay in the region's persistently cool wet environment.

Archaeological evidence from southeast Kodiak Island, including the Old Harbor area indicates that people of the Ocean Bay tradition maintained residences in strategic locations that allowed them to take advantage of ecological variability. Residential sites of this period have been found mostly on mid-bay coastal locations where marine oriented hunter-gatherers could have moved efficiently between outer and inner bay environments in response to resource availability and traveling conditions.

The Old Harbor Native Corporation (OHNC) has been an active sponsor of archaeological research in areas surrounding their community. A multi-year survey of Sitkalidak Island, southeast of Old Harbor, led to the discovery of more than 100 previously unknown sites and several small excavations that produced important artifact assemblages, giving Old Harbor residents an opportunity to participate in unearthing their heritage.

As part of the past licensing effort, AVEC contracted with the Alutiiq Museum and Archaeological Repository to perform a reconnaissance level archaeological survey along the proposed Project footprint specifically to look for the presence of cultural resources. The report did not find any sites within the Project boundaries but did note that there is one potentially significant prehistoric site located about 200 meters south the City of Old Harbor pump house location and is next to the outwash plane of Lagoon Creek as it empties into the Salt Lagoon (Fitzhugh 1997).

4.3.5 Nexus between Project Operations and Effects

The construction of the Old Harbor Hydroelectric Project may directly affect cultural resources, if they are found in the area.

4.4 Study Area

The proposed study area includes the project boundary, defined by the 100-foot buffer around all Old Harbor Hydroelectric Project components.

4.5 Methodology

AVEC will contract the services of a professional cultural resources consultant who will use currently accepted practices as defined under Section 106 of the NHPA of 1966 (as amended), and implementing regulations (36 CFR 800), the Secretary of the Interior's Standards and Guidelines (1983:44722), and the Advisory Council on Historic Preservation's general guidelines for identification and testing procedures as set forth in *Treatment of Archaeological Properties, A Handbook*.

4.5.1 Background Research

All pertinent archeological and historical literature and the records of the Alaska Heritage Resources Survey (AHRS) will be reviewed to compile information about the project's defined APE. This effort will focus on determining if there are any known buildings, structures, and objects in the APE that are listed in or otherwise eligible for the National Register.

Information will also be sought from consulting parties and others likely to have knowledge of, or concerns with, historic properties in the area. Specific attention will be given to properties and effects of concern to Native tribes and organizations. Federally recognized tribes will be consulted on a government-to-government basis, recognizing their sovereign status. Attention will be paid to concerns about properties of religious and cultural significance, regardless of who may own such properties.

4.5.2 Intensive Field Surveys

The goal of the intensive field survey will be to locate all previously unknown, but potentially eligible properties in the APE. Intensive surveys will include systematic pedestrian examinations of the ground surface and subsurface testing. Surface collecting and mapping will be used to establish site boundaries. The intensive survey will include subsurface testing as a major component for field sampling. Field notes, samples, artifacts and other collected data will be curated with the University of Alaska Museum in Fairbanks unless otherwise specified.

In the event that human remains are discovered, excavations will continue only to the extent necessary to verify that the remains are human. After verification, excavations in the vicinity will cease and the SHPO will be notified.

4.6 Reporting

In accordance with 18 CFR § 5.15(b), a Cultural Resources Study Progress Report will be prepared and provided to participants for technical review of preliminary findings prior to the completion of the study. The progress report will describe overall progress in completing data collection and explain any variance from the study plan and schedule. In accordance with 18 CFR § 5.15(c)(1), the cultural resources report will be prepared and provided to participants for review and comment at the conclusion of the studies.

4.7 Schedule

The Cultural Resources Study field effort will be initiated on June 7, 2010. A progress report will be filed on September 1, 2010. The Cultural Resources Study Report will be filed on November 23, 2010.

4.8 References

Fitzhugh, B.J. 1997. Archeological Survey for the Old Harbor Small Hydroelectric Project Old Harbor, Alaska. Prepared in conjunction with the Alutiiq Museum and Archaeological Respository.

U.S. Fish and Wildlife Service (USFWS). 2008. Revised Comprehensive Conservation Plan Kodiak National Wildlife Refuge. Prepared by the USFWS Region 7.

5.0 Bald Eagle Nest Survey Study Plan

5.1 Introduction

AVEC proposes to complete an inventory of bald eagle nests in the Old Harbor Hydroelectric Project area through a review of existing information and a reconnaissance field survey.

5.2 Goals and Objectives

The goal of the study is to identify and map bald eagle nests in the Old Harbor Hydroelectric Project area.

The specific study objectives are to:

- Locate bald eagle nests.
- Map bald eagle nest locations using GIS.
- Characterize whether the nests are active or abandoned.

5.3 Study Background

5.3.1 Issues Identified

The FERC's ILP requires an assessment of potential beneficial and adverse effects of the project on wildlife, including bald eagles, in the license application. This study will develop information needed to evaluate potential impacts of the construction of a hydroelectric project in Old Harbor on these protected birds.

5.3.2 Study Requests

In their PAD comments letter dated November 20, 2009, the USFWS requested completion of a bald eagle survey in order to design the facility away from active or potentially active nests.

5.3.3 Resource Management Goals

One goal of the Kodiak NWR Revised Comprehensive Conservation Plan is: Monitor populations of resident and migratory birds as indicators of ecosystem health (Goal 5; USFWS 2008). The plan identifies an objective related to this goal which includes continued periodic monitoring of trends in distribution, size, and reproductive success of the Refuge's population of nesting bald eagles. Nationally, the USFWS Migratory Bird Management Program manages bald eagles with the goal of stable or increasing or breeding populations of U.S. bald eagles.

5.3.4 Existing Information

Bald eagles are an important nesting species in the Kodiak NWR. They nest primarily in large cottonwood trees. In 2002, 538 (55%) of 979 Bald Eagle nests in the Kodiak NWR were occupied. Nesting success was 52%. Since 1963, the number of bald eagle nests on Kodiak NWR increased 241% and the total production of young increased 425%. Despite decreased

nest success and lower productivity per occupied nest, the Kodiak NWR nesting bald eagle population continues to increase (Zwiefelhofer 2007). A bird field survey conducted in the previous Old Harbor Hydroelectric project area in August 1996 found three abandoned nests and one active nest in the lower Lagoon Creek basin (MacIntosh 1996). The active nest had two full-sized young. The *Alaska Bald Eagle Atlas* shows one nest in the Lagoon Creek basin and five nests in the Big Creek Basin (USFWS 2009).

The bald eagle is protected under the Bald Eagle Protection Act of 1940 as amended (16 U.S.C. §§ 668-68d) and the Migratory Bird Treaty Act of 1918 (16 U.S.C. §§ 703-12). The Bald Eagle Protection Act prohibits anyone from "taking" bald eagles, their eggs, nest or any part of these birds. The Act defines "taking" as "to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb."

USFWS recommends a primary 330-foot buffer zone and a secondary 660-foot buffer zone around eagle nest trees. The management objective of the primary zone is to provide protection of the juvenile eagles in the nest tree and to buffer the tree from human activities during nesting season (March through August in Alaska), when nests are most vulnerable to disturbance by human activity such as logging and construction. The management objectives of the secondary zone are to protect the nest from noise and obstructive activities and to protect nesting habitat within the primary zone. The secondary zone extends from the primary zone to a distance of 660 feet from the nesting tree. When topography or vegetation does not adequately protect the nest from human disturbance, the buffer zone may be increased by ¼ to ½ mile. However, the actual size of the buffer zone could vary depending on the eagle's tolerance for human disturbance (USFWS 2007).

5.3.5 Nexus between Project Operations and Effects

The construction of the Old Harbor Hydroelectric Project may directly affect bald eagle nesting activities, if nests are found near the project area.

5.4 Study Area

The proposed study area for the bald eagle nest field survey includes the project boundary, defined by the 1,000-foot buffer around all Old Harbor Hydroelectric Project components. Since eagles primarily nest in cottonwood trees, the survey will focus on areas where these trees are found.

5.5 Methodology

5.5.1 Background Research

USFWS representatives will be consulted to gather existing information on known nests in the Old Harbor area.

5.5.2 Intensive Field Surveys

A helicopter will be used to survey eagle nest locations. Once a nest is observed, the location will be documented using a Geographic Positioning System (GPS). Using binoculars, the observer will document nest characteristics including whether the nest is active or abandoned, evidence of eggs, eagle use of nest (e.g., new material present, eagle(s) nestbuilding, eagle in incubating posture, etc.), number of adults, number of nestlings, and status of nestlings (downy, 0-2 weeks old; partly feathered, 2-7.5 weeks old; feathered, 7.5+ weeks old; fledged). In addition, details on nest and nest tree condition, age of other eagles observed, behavior of all eagles observed, and any other observations pertinent to bald eagle ecology will be collected. Nest visits by helicopter will be as brief as possible, and will stay as far as possible from nests and eagles, while striving to achieve the goals of the survey.

5.6 Reporting

In accordance with 18 CFR § 5.15(b), a Bald Eagle Nest Survey Study Progress Report will be prepared and provided to participants for technical review of preliminary findings prior to the completion of the study. The progress report will describe overall progress in completing data collection and explain any variance from the study plan and schedule. In accordance with 18 CFR § 5.15(c)(1), the report will be prepared and provided to participants for review and comment at the conclusion of the studies.

5.7 Schedule

The Bald Eagle nest survey effort will be initiated on June 7, 2010. A progress report will be filed on September 1, 2010. The Bald Eagle Nest Survey Report will be filed on November 23, 2010.

5.8 References

MacIntosh, Richard A. 1996. Bird Observations on a 9 August, 1996 Visit to the Proposed Site of a Small Hydroelectric Development Near Old Harbor, Kodiak Island, Alaska.

U.S. Fish and Wildlife Service (USFWS). N.D. Alaska Bald Eagle Atlas. Accessed at http://alaska.fws.gov/mbsp/mbm/landbirds/alaskabaldeagles/default.htm. Accessed on December 28, 2009.

U.S. Fish and Wildlife Service (USFWS). 2008. Revised Comprehensive Conservation Plan Kodiak National Wildlife Refuge. Prepared by the USFWS Region 7.

U.S. Fish and Wildlife Service (USFWS). 2007. National Bald Eagle Management Guidelines. Accessed at: http://alaska.fws.gov/eaglepermit/pdf/national_guidelines.pdf.

Zwiefelhofer, Dennis. 2007. Comparison of Bald Eagle (*Haliaeetus leucocephalus*) Nesting and Productivity at Kodiak National Wildlife Refuge, Alaska, 1963–2002. Journal of Raptor Research 41(1):1-9.